

Highway Safety Improvement Program Manual

Utah Department of Transportation
Division of Traffic and Safety



April 2011

1. INTRODUCTION

The Highway Safety Improvement Program (HSIP) is used by the Utah Department of Transportation (UDOT) to fund projects that advance roadway safety goals in Utah.

1.1. HSIP Description

The HSIP was upgraded to a core highway program in 2005 as part of a federal transportation bill, the *Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users* (SAFETEA-LU). This legislation states that the purpose of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads (federal, state, or local) through the implementation of infrastructure-related highway safety improvements and non-infrastructure efforts such as education, crash database development, and program management. The HSIP emphasizes a strategic, data-driven, and result-focused approach to improving highway safety.

The federal HSIP includes the following sub-programs:

- Strategic Highway Safety Plan (SHSP).
- Railway-Highway Crossings (RRX).
- High Risk Rural Roads Program (HRRRP).

The focus of this manual is the core HSIP and not the sub-programs. Each of these subcategories is covered in separate publications.

1.2. Purpose of the HSIP Manual

The purpose of this manual is to:

- Define the parameters of the HSIP.
- Define the roles of different parties involved with this program.
- Define and describe HSIP processes.
- Provide readers with a solid understanding of how the HSIP is managed within the state of Utah by UDOT.

The manual is useful for the following audiences:

- UDOT employees and managers involved with HSIP processes.
- UDOT consultants that are contracted to perform functions within HSIP processes.
- Federal regulators (e.g. the Federal Highway Administration (FHWA)) seeking to determine how UDOT is implementing the HSIP.
- General public.

This manual can be downloaded from the UDOT website by going to the following webpage: www.udot.utah.gov/go/hsip.

1.3. Manual Outline

This manual is organized into the chapters listed below. The appendix contains more detailed information about specific elements that readers may be interested in, but which are not included in the main chapters of the manual.

- Chapter 1: Introduction
- Chapter 2: Program Oversight & Funding
- Chapter 3: Partners
- Chapter 4: Infrastructure Project Process
- Chapter 5: Non-Infrastructure Project Process
- Chapter 6: Reporting
- Chapter 7: Appendix

Chapters 4 and 5 contain the bulk of the information that will be most useful to readers. A flowchart depicting the HSIP infrastructure process is shown on the following page. A separate flowchart is shown later in the manual to depict the non-infrastructure project process.

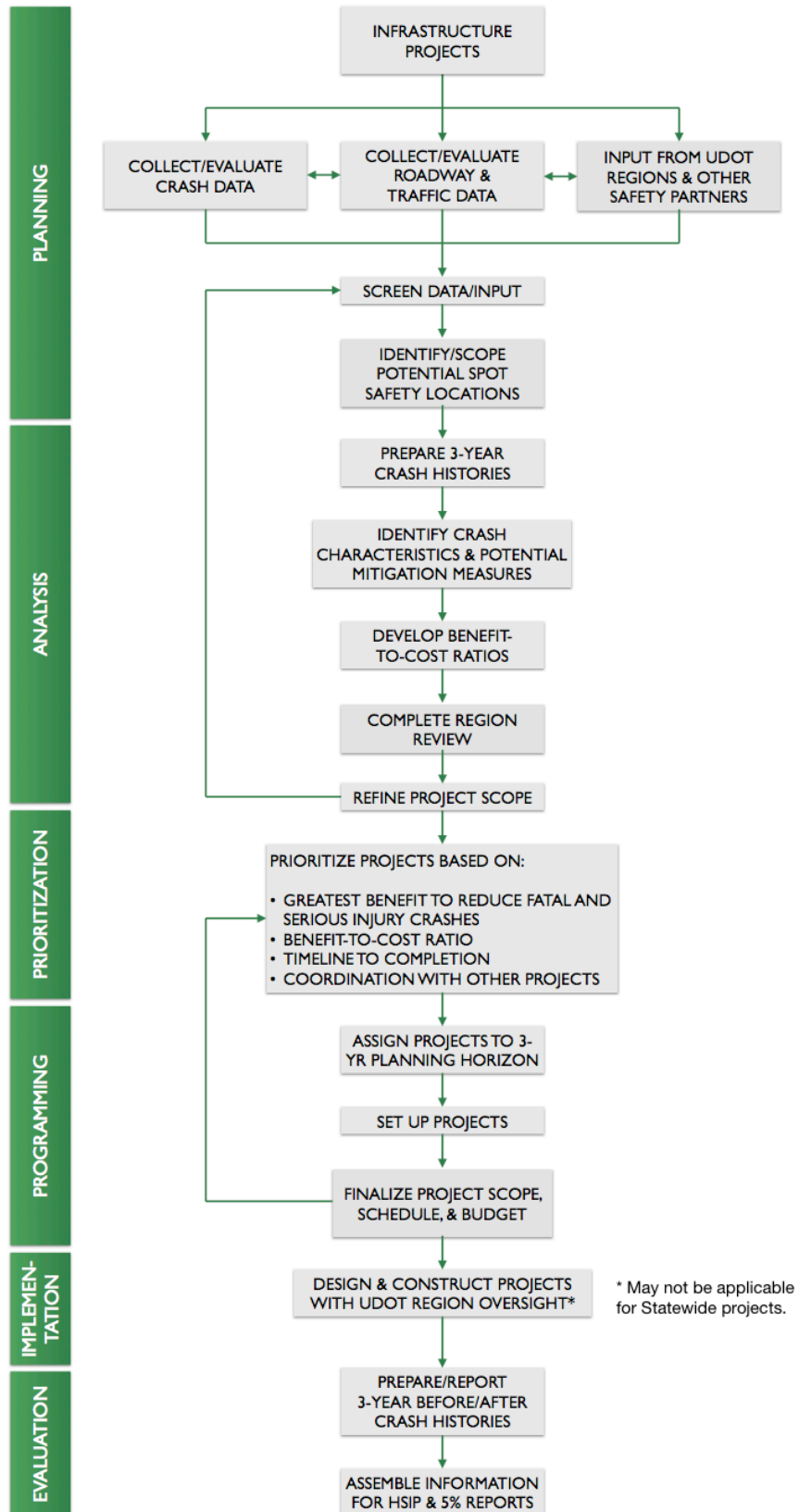
1.4. Relationship of HSIP and SSIP

UDOT manages another program called the Spot Safety Improvement Program (SSIP). The two programs are similar in purpose, which is funding roadway safety projects. UDOT follows similar processes for both programs. SSIP lends itself well to projects where UDOT crews are used to complete the work because unlike HSIP projects, SSIP projects are not required to be competitively bid. SSIP funds are also used proactively to mitigate potential safety hazards. See the SSIP Manual for more information on this program.

1.6. Safety Program Information Legal Protections

Under U.S. law (Section 23 USC 409), crash data is protected from use in a court of law. UDOT aggressively exercises its rights to keep crash data and associated HSIP program information out of courts of law. Section 23 USC 409 reads as follows:

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.



1.6. Acronyms

Many different acronyms are used throughout this manual. The following is a list of those acronyms and a description of what each of them stands for.

| | |
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| DOT | Department of Transportation |
| FHWA | Federal Highway Administration |
| HRRRP | High Risk Rural Roads Program |
| HSIP | Highway Safety Improvement Program |
| MPO... .. | Metropolitan Planning Organization |
| PE | Professional Engineer |
| PM..... | Project Manager |
| PTOE.. .. | Professional Traffic Operations Engineer |
| RRX | Railway-Highway Crossings |
| SAFETEA-LU | <i>Safe, Efficient, Flexible, Efficient, Transportation Equity Act: A Legacy for Users</i> |
| SHSP | Strategic Highway Safety Plan |
| SSIP | Spot Safety Improvement Program (State Funded) |
| UDOT | Utah Department of Transportation |
| 23 USC | Title 23 United States Code |

2. PROGRAM OVERSIGHT & FUNDING

SAFETEA-LU provided \$5.06 billion to the 50 states and the District of Columbia, spread over a five-year period beginning in 2005 and ending in 2009. The U.S. Congress has continued funding the HSIP by extending the existing federal transportation since SAFETEA-LU expired. The portion of legislative code from SAFETEA-LU that relates to the HSIP is included in the appendix (Chapter 7).

2.1. HSIP

The HSIP is administered at the federal level by the U.S. Department of Transportation's FHWA Office of Safety. FHWA works with each state's Department of Transportation (DOT) to achieve implementation of the HSIP at the state level. As such, UDOT is responsible for implementing the program within Utah. Each state DOT is accountable to FHWA for making sure that HSIP money is spent on appropriate activities. However, states are given considerable flexibility to determine how to best implement the HSIP in their areas.

2.1.1. Federal Oversight & Funding

The \$5.06 billion appropriated by SAFETEA-LU for the HSIP is apportioned to the states based on the following three factors (which receive equal weight), with no state to receive less than 0.5% of the total:

- Ratio of lane-miles of federal-aid highways in each state to total lane miles of federal-aid highways in all states.
- Ratio of vehicle-miles traveled on lanes of federal-aid highways in each state to total vehicle-miles traveled on lanes of federal-aid highways in all states.
- Ratio of number of fatalities on the federal-aid system in each state to the number of fatalities on the federal-aid system in all states.

In order to obligate HSIP funds, each state must fulfill the following requirements:

- Develop and implement an SHSP.
- Produce a program of projects or strategies to reduce safety problems.
- Evaluate the SHSP and overall HSIP on a regular basis.
- Submit annual HSIP Report (See Chapter 6).
- Submit annual 5% Report (See Chapter 6).

Each state's apportionment of HSIP funds is subject to a set-aside for the HRRRP. States are also allowed to use HSIP funds to address their reporting requirements (see Chapter 5).

The FHWA website includes information about various aspects of the HSIP. To access this information, click on the following link: safety.fhwa.dot.gov/hsip. FHWA has also published its own HSIP Manual. The focus of this manual is helping state DOTs to develop their own comprehensive HSIP processes. A link to a webpage where this manual can be downloaded is provided in the appendix (Chapter 7).

2.1.2. State Oversight & Funding

UDOT's Safety Programs Engineer oversees HSIP activities within Utah. This person is responsible for setting the policies and procedures required to fulfill the federal HSIP mandate set forth by SAFETEA-LU. UDOT uses its federal HSIP apportionment to pay for the following items:

- HSIP infrastructure projects.
- Non-infrastructure needs, such as crash database development, that are important to furthering the HSIP goals.
- Safety education program.
- Fees for consultants that perform specific supporting roles in the HSIP.

The main sources of feedback provided by UDOT come in the forms of two reports – the HSIP Report and the 5% Report. These documents are described in Chapter 6, Reporting.

3. PARTNERS

The HSIP is a partnership between federal agencies, the UDOT Traffic & Safety Division, the four UDOT region offices, local agencies, consultants, and construction contractors. Each partner plays an important role in the success of this program. Chapter 3 describes the roles of these major partners.

3.1. Federal Highway Administration

It is FHWA's responsibility to manage the HSIP on the federal level. They work with state DOTs to implement the program. FHWA also provides program implementation guidance on their website, which may be found at safety.fhwa.dot.gov/hsip. Each fiscal year, UDOT must submit two reports (described in Chapter 4) to the FHWA Utah Division office, who forwards them to the FHWA Office of Safety in Washington, DC. Contact information for the person currently serving as the Safety Program Manager in the FHWA Utah Division is listed below.

Roland Stanger
FHWA Safety Program Manager for Utah
roland.stanger@dot.gov
(801) 955-3515

3.2. UDOT Traffic & Safety Division

The UDOT Traffic & Safety Division is responsible for the general implementation and oversight of all of UDOT's safety programs, including the HSIP. Division staff perform multiple functions to facilitate the infrastructure and non-infrastructure processes described in Chapters 4 and 5.

The Safety Programs Engineer heads the HSIP implementation effort. The contact information for the person in this position at the time of this writing is listed below.

W. Scott Jones, PE, PTOE
Safety Programs Engineer
wsjones@utah.gov
(801) 965-4285

3.3. UDOT Region Offices

The UDOT region offices play a major role in the development and implementation of HSIP projects. They work in concert with the UDOT Traffic & Safety Division to identify potential project locations, submit an HSIP funding application, and participate in the screening and prioritization process. A link to the HSIP application is provided in the appendix (Chapter 7). Once projects are selected and funded in each region, the region offices take ownership of the projects, assign Project Managers (PMs), and implement them according to standard federal environmental, design, and construction processes. Contact information for UDOT's region offices is available on the Internet at <http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:38>.

3.4. Local Agencies

HSIP funds can be used for infrastructure improvements on any publicly owned roadway. Any non-UDOT agency may apply for HSIP funding as long it owns the right-of-way for the location in question. However, the Traffic & Safety Division researches the crash history at these locations just as they do with projects developed internally. All locations must show a proven crash history in order for HSIP funding to be used. A link to the application for non-UDOT agencies is provided in the appendix (Chapter 7).

If UDOT chooses to fund a project on a non-state road, the local agency with ownership of the right-of-way will be involved as a partner. In this case, projects will follow the standard UDOT Local Government project process instead of the standard UDOT Region project process.

3.5. Consultants & Contractors

The UDOT Traffic & Safety Division and region offices often contract portions of HSIP projects (both infrastructure and non-infrastructure) to consultants and contractors. Infrastructure projects must be constructed by private contractors chosen through standard UDOT procurement processes.

3.6. Safety Organizations

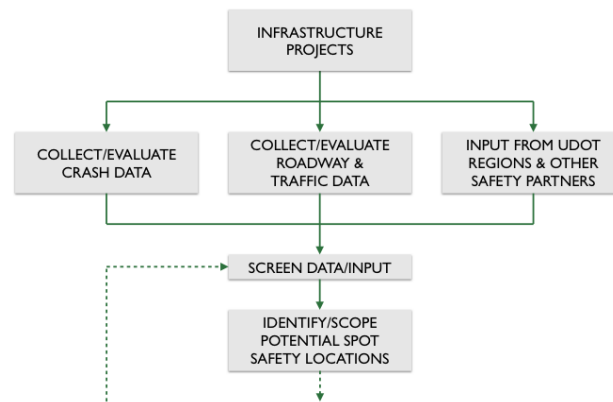
The Traffic & Safety Division works with numerous agencies and organizations that are involved in roadway safety. These organizations' input is sought as programs are developed and implemented. Their insight is especially valuable for creating roadway safety education and enforcement campaigns.

4. INFRASTRUCTURE PROJECT PROCESS

This chapter discusses the process by which HSIP infrastructure projects are conceived, selected, and implemented. The six-step process involves collaboration between the UDOT Traffic & Safety Division, FHWA, and the UDOT region offices to select projects and then move them through to construction. Each of the intermediate processes from planning to evaluation is discussed in the following sections.

4.1. Planning

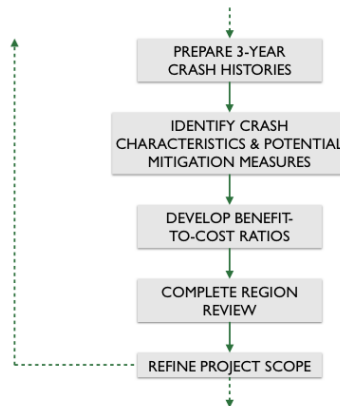
The flowchart below illustrates the activities that are part of the Planning steps of the HSIP infrastructure project process.



The first steps in the planning process are crash and traffic data collection, crash and traffic data evaluation, and solicitation of input from UDOT region offices and other safety partners. Each region office sends an annual submittal to the Traffic & Safety Division that identifies their priority projects for HSIP funding consideration. The Traffic & Safety Division then screens the crash data, traffic data, and input from the region offices and other safety partners to identify potential spot safety locations. At this stage of the process, the regions do not distinguish whether they would like to ultimately fund each project through the HSIP or SSIP. The Traffic & Safety Division makes this determination at a later stage of the process.

4.2. Analysis

The flowchart on the next page illustrates the activities that are part of the Analysis steps of the HSIP project process.

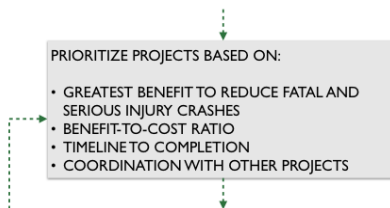


Following the Planning steps, potential spot safety locations are moved forward for a more extended analysis. A three-year crash history is compiled for each candidate location. Crash characteristics are analyzed and potential measures to mitigate those characteristics are identified. Benefit-to-cost ratios are calculated for each location based on the crash history, the expected decrease in crashes for a potential mitigation measure, and the cost of that mitigation measure.

Traffic & Safety Division staff, an FHWA representative, and various region staff review the potential HSIP project locations. At this stage of the process, potential projects may be re-analyzed and the scope of the project may be changed as necessary. The modified project will then go through the aforementioned steps a second time.

4.3. Prioritization

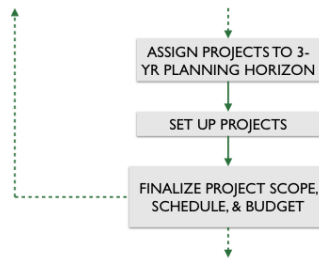
The flowchart below illustrates the activities that are part of the Prioritization steps of the HSIP project process.



Once the Analysis steps are complete, projects that make it through to this stage are prioritized. The prioritization is based on the factors listed in the flowchart and is conducted by the Traffic & Safety Division.

4.4. Programming

The flowchart on the next page illustrates the activities that are part of the Programming steps of the HSIP project process. The Traffic & Safety Division conducts the programming process.



Projects that receive sufficient priority to warrant funding are assigned to the three-year planning horizon. A report is compiled for each of the four UDOT regions, showing the HSIP projects that the Traffic & Safety Division has chosen to fund over the following three-year period. Each project is set up in UDOT's system and the scope, schedule, and budget are finalized.

Because this covers a three-year period but is re-evaluated yearly, it is possible for re-prioritization or shifts in funding to occur periodically that may result in modified or new projects with higher priorities taking the place of previously programmed projects. At this stage of the process, feasible projects that do not have a crash history may be considered for funding through the SSIP.

4.5. Implementation

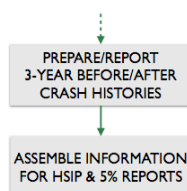
The flowchart below illustrates the activities that are part of the Implementation steps of the HSIP project process.



After projects have been programmed through the Traffic & Safety Division, the region PM shepherds the project through the standard region environmental, design, and construction processes.

4.6. Evaluation

A key component of successfully managing any program is the periodic evaluation and reporting of progress toward pre-determined goals. As mentioned in Chapter 1, the federal SAFETEA-LU legislation states that the goal of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements. This section describes the ways in which UDOT evaluates progress toward this goal. The flowchart below illustrates the evaluation part of the HSIP project process.

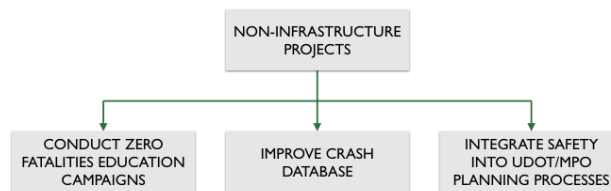


As discussed in Section 4.1, three years of crash history is analyzed at each HSIP project location as part of the initial screening process. After three years have elapsed following construction of a given HSIP project, the crash history for the three-year post-construction period is analyzed. The Traffic & Safety Division compares before and after crash histories to assess each project's impact on safety.

The before and after comparisons are a major input to the HSIP Report and 5% Report documents that UDOT must submit to FHWA each year. These reports are described in Chapter 6.

5. NON-INFRASTRUCTURE PROJECT PROCESS

UDOT uses some of its HSIP funding for non-infrastructure projects that aid roadway safety efforts. This chapter describes the different categories of non-infrastructure work items that UDOT uses HSIP funding to implement. FHWA requires states to include a narrative explaining their non-infrastructure efforts in their annual reporting. The following flowchart shows the steps of the non-infrastructure portion of the overall HSIP project process.



5.1. Educational Program

Under Section 23 USC 148, a state may “flex” up to 10% of HSIP funds to carry out non-infrastructure safety projects as provided in the state’s SHSP. Currently UDOT uses the HSIP “flex” funding for its Zero Fatalities program. Zero Fatalities is a mutual effort between various partners to address the top behaviors that lead to fatalities on Utah’s roads. Behaviors such as drowsy driving, distracted driving, aggressive driving, impaired driving, and lack of seatbelt usage are emphasized. Television and radio public service announcements, community events, internet articles, and local media stories are used to convey the Zero Fatalities message.

5.2. Improving Crash Data Analysis

HSIP funding is also used to improve UDOT’s crash database capability. The ability to accurately locate crash sites and understand their characteristics is vital for efforts to program limited funding for projects that best address existing safety concerns.

5.3. Integrating Safety into Planning

UDOT Traffic & Safety Division personnel work with the Planning Division to integrate safety planning into their core processes. UDOT also works with Metropolitan Planning Organizations (MPOs) across the state to supply them with data and tools to better integrate safety into their internal planning processes. Integrating safety into UDOT and MPO planning processes helps all agencies address safety in a proactive way.

5.4. Consultant Support

The Traffic & Safety Division uses HSIP non-infrastructure funding to contract with universities and consultants who assist with various non-infrastructure functions. These functions include items such as program management, project management, crash data mapping, statistical analysis, report preparation, and training.

6. REPORTING

FHWA requires UDOT to submit two reports annually – the HSIP Report and the 5% Report. UDOT's ability to obligate HSIP funds is conditional upon submission of these reports. Both reports are due to FHWA by August 31st of each year. Examples of these two reports are included in the appendix (Chapter 7).

6.1. HSIP Report

The HSIP Report contains information about UDOT's implementation of both HSIP infrastructure and non-infrastructure projects. FHWA requires the HSIP Report to include the following elements:

- Description of progress toward implementing highway safety improvement projects.
- Assessment of effectiveness of particular projects towards achieving safety goals.
- Assessment of HSIP projects' contribution to reducing roadway-related fatalities, injuries, and crashes.
- Assessment of HSIP projects' contribution to mitigating the impacts of roadway-related crashes.
- An accounting of the HRRRP, including:
 - Progress being made to implement HRRRP projects on rural major or minor collector, or rural local roads.
 - Assessment of the effectiveness of improvements made with HRRRP funds.
 - Description of the extent to which the improvements contribute to reductions in fatalities, injuries, and crashes.

6.2. 5% Report

The 5% Report describes at least five percent of locations with the most severe safety needs. It must include an assessment of remedies, costs, and other impediments (other than cost) to solving the problems at each location. The determination of these locations is to be made using criteria deemed by UDOT to be most appropriate for establishing relative severity in terms of crashes, injuries, deaths, traffic volume, and other data. The 5% Report is posted publicly on FHWA's website.

7. APPENDIX

The appendix contains more detailed information about specific elements of the HSIP that readers may be interested in, but which do not merit inclusion in the previous portions of the manual. The following list shows the items that can be found in the appendix. Each item is coded as an active electronic link.

- [23 USC 409 \(safety program information legal protections\)](#)
- [23 USC 148 \(Federal authorization for the HSIP\)](#)
- [FHWA HSIP Manual](#)
- [HSIP UDOT Region Application](#)
- [HSIP Non-UDOT Entity Application](#)
- [HSIP Report \(Sample\)](#)
- [5% Report \(Sample\)](#)